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AB/Response
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT application of:

Applicant:	Richard Ian Laming et al.
Application No.:	09/688,668
Filed:	October 16, 2000
Title:	OPTICAL FIBRE LASER
Examiner:	Martin J. Angebranndt
Art Unit:	1756
Attorney Docket No.	DYOUP0203US

COPY OF PAPERS ORIGINALLY FILED

REPLY TO OFFICE ACTION DATED MARCH 27, 2002

Commissioner for Patents
United States Patent and Trademark Office
Washington, DC 20231

Sir:

Favorable reconsideration of the above-referenced application is respectfully requested in view of the following remarks.

In section 3 on page 2 of the Office Action, the Examiner considers the substitute declarations to be defective. Based upon the explanation provided by the Examiner, it is believed that one or more pages of the substitute declarations filed on May 7, 2001 are missing from the Examiner's file. To remedy this, enclosed is another copy of the substitute declarations.

On one of the PTO-1449 forms returned with the Office Action, the Examiner did not acknowledge consideration of one of the documents because a copy was not received although it is believed a copy was submitted with the Information Disclosure Statement that listed the same, enclosed is another copy of the Set et al. article entitled "High Bitrate Operation of a Novel Optical Phase Conjugator Using Inline Fibre DFB Lasers."

Regarding another formal matter, the Examiner acknowledged receipt of a certified copy of the British priority application in "this National Stage application." It is noted that the present application is a continuation of International Application No. PCT/GB99/o1105. Please confirm that no additional certified copy of the priority application need be provided in this continuation application.

Turning now to the merits, the Examiner has rejected independent claim 1 as being anticipated by or unpatentable over Storoy et al. "Single Polarisation Fibre DFB Laser" (hereinafter Storoy) taken alone or in combination with Erdogan et al. "Charcachtorization of UV-Induced Birefringence in Photosensitive Ge-Doped Silica Optical Fibers" (hereinafter Erdogan), Byron U.S. Patent No. 5,956,442 (hereinafter Byron) and Dong et al. U.S. Patent No. 5,881,197 (hereinafter Dong). However, for at least the reasons discussed below, it is respectfully submitted that the applied references neither anticipate nor render obvious the subject matter of claims 1-11.

Claim 1 covers a method comprising, inter alia, a step of forming a grating structure in an optical fiber by using a writing light beam polarized in a direction not parallel to the fiber axis, the grating structure comprising a discrete phase shift which is substantially identical for two orthogonal polarization modes of the fiber. The method provides a single mode fiber laser by a one-step grating fabrication process.

In contrast, Storoy describes a two-step process involving a post-processing step to achieve a single mode fiber laser. In the first part of Storoy's process, a grating is written into a fiber using a writing light beam polarized perpendicular to the fiber axis (page 57, last sentence of *Grating birefringence* paragraph). The grating is stated to comprise two parts with an arbitrary phase shift between them (page 57, lines 7 and 8 of first *Experiments* paragraph). However, the skilled person reading Storoy as a whole would readily understand that this arbitrary phase shift is not substantially identical for two orthogonal polarization modes in the fiber. For example, the grating is written in two parts (page 57, last sentence of second *Experiments* paragraph), which means that before the post-processing step a phase shift arises from the part of the fiber between the two parts, which has not been written and hence has the inherent birefringence of the fiber, which gives a different phase shift to the two orthogonal polarization modes. Storoy does not, therefore, teach the claim 1 feature of writing a grating comprising a discrete phase shift which is substantially identical for two orthogonal polarization modes.

Furthermore, the whole aim of Storoy's teaching is to achieve different phase shifts for each polarization mode, so that it would be undesirable to modify the first stage of his process so as to write a grating having an equal phase shift. The operation of Storoy's single mode fiber relies on providing a different phase shift for each polarization mode (by modifying the birefringence in the post-processing step), because this gives a different cavity finesse for each mode so that only one of the modes can reach threshold and hence lase (page 57, second *Experiments* paragraph).

Erdogan also teaches the writing of a grating by using a writing light beam polarized orthogonally to the fiber axis (Figure 4 and associated text). However, this is not with the object of producing a fiber laser, and the subject of writing a grating comprising a phase shift is not addressed. Moreover, it is advised by Erdogan that better gratings can be produced by using a writing light beam polarized parallel to the fiber axis than by using one polarized perpendicular to the fiber axis (final paragraph of *Experimental Results* section). Hence, Erdogan does not contain any teaching that could be combined with the teaching of Storoy to give the method of claim 1.

The remaining references applied by the Examiner, Byron and Dong, are cited against dependent claims 2 to 11 only, and do not overcome the deficiencies of Storoy or Erdogan vis-a-vis the subject matter of claim 1.

In view of the foregoing, withdrawal of the art rejections is respectfully requested.

Respectfully submitted,

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CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, United States Patent and Trademark Office, Washington, D.C. 20231.

Date: 8-26-02

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